UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN.
Prepared by Solon R. Barber,
Radio Service.

Wednesday, Jan.11.

(NOT FOR PUBLICATION)

ANNOUNCEMENT: Some folks seem to think that weather forecasting is one of the Black Arts. Or else just pure guesswork. It is to laugh. For really those weather notices you see in the papers each morning are founded on scientific reasoning and observations and aided by delicate instruments which would make a combined harvester turn pale with envy. In today's CHAT BY THE WEATHER MAN, that mysterious gentleman is going to tell Station_____'s listeners some secrets about these complicated weather instruments. Please stand by.

---ooOoo---

It's lucky that my visitor came in when the day's rush was over. If he had come to see me while we were busy tabulating the morning's weather telegrams, I'm afraid he would have had to sit and think for an hour or so until our rush work was over.

But as it happened, the weather map for the day was done. We had answered the morning's 'phone calls and told Mrs. Jones that she could wash her clothes and hang them out, because we didn't think it woult rain today. We had adivsed the railroad people that we didn't look for any freezing weather for a day or so--told the city commissioners that they had better have their snow plows ready for Friday or Saturday when a snow storm was likely--- and advised a score more folks on this and that.

I had just heaved a big sigh of relief and was sitting back in my desk chair, vowing that I wasn't going to forget my New Year's resolutions so soon, when---

In came the visitor, announced by a rattling knock on the door.

"Come in", said I, expecting something interesting. I got it.

The visitor was a giant of a man, burned a red-brown by the sun and wind of the desert. He wore a big black sombrero. Said he was the owner of the Crow-foot Ranch out Salt Creek way and that he was in town to sell some cattle. His name, he announced, was Austin, Jim Austin. Everybody in Salt Creek would know him, he said.

"What can I do for you, Mr. Austin?" I asked.

"I want to see a live Weather Man before I go back to feeding cattle", said the visitor. "And I want to go up there on top of this building and look inside that chicken coop up there where you keep the man who makes the weather. Can you fix it so I can?"

"Certainly", said I. "But you don't have to climb up to that room on the Federal Building to see a weather man. Take a squint at me".

Austin did--- and seemed disappointed. But he was not to be put off. So I told him that we kept weather instruments in that shelter on top of the building and that we also had a few instruments right down there in the office. I showed him a meteorograph and explained how it works. The meteorograph is an apparatus that automatically registers wind direction and velocity, precipitation and sunshine, and it's almost human. It makes records of the weather that HAS ALREADY HAPPENED--- but not even a meteorograph can predict the sort of weather that's coming in the future, I told the visitor.

Well, when I had finished the explanation, Austin told me he'd always wanted to see that instrument THAT PREDICTS THE WEATHER. Said he'd heard about such a machine, but had never seen one with his own eyes. So I had to repeat my little speech again and tell Austin that the meteorograph positively does not PREDICT tomorrow's weather, but merely the weather as it occurs.

When I got through, Austin fished a scrap of newspaper out of his coat pocket, gave it to me, and said--- "How do you fellows make up these weather notices, then?"

I read the notice. It was a regular FAIR AND WARMER TODAY observation.

But the visitor wanted the whole story, so I decided to take him up to the weather tower and give him a look at the other instruments up there. As we climbed the stairs, I began---

"Benjamin Franklin observed that storms move eastward across the country", I began. You see I had an idea by this time that Austin was half joking, so I decided to see the thing through. Well, to make a long story short, I told him that great swirls or eddies in the atmosphere, hundreds of miles across, move from west to east across the country, as a rule. These areas are called AREAS OF LOW PRESSURE, or cyclones, or else just plain STORMS.

"Now", I continued, "there are 200 weather stations, similar to this one, in all parts of the United States. These stations are connected with each other by telegraph lines. So, when these Areas of Low Pressure--- these Storm areas--- move along, generally at a speed of 25 to 40 miles an hour, the stations take their measurements as they move. The storms--- their speed, direction, and so on--- are carefully mapped and then the information is sent on to other stations".

Austin seemed to be seeing a great light. "But how do you measure the storms?" he asked.

We were up on the roof of the Federal building by now, and inside of the tiny enclosed weather tower. The weather instruments were before us.

"With such instruments as these", I replied to Austin's question. "Here's the instrument board. These are barometers. They measure and record the weight, the pressure, of the air. And these thermometers here measure and record the temperature and moisture content, or humidity, of the air. Here are some wind vanes and an-e-mo-me-ters to measure and indicate the direction and speed of

the wind. The ne-pho-scopes here help us study the kinds of clouds in the sky as well as the direction in which they are moving. We have still other instruments, such as the meteorograph I showed you downstairs. There are also instruments to measure rain and snow fall".

"What good are these jiggers, anyhow?" Austin wanted to know.

"They tell us the condition of the atmosphere so accurately that we're able, when we have all the rest of the weather information that comes to us from other observers in different parts of the country, to predict the weather from a few hours to 42 hours in advance", I said. "The predictions are correct nine times out of 10".

I noticed that Austin was impressed. "How's it done?" he asked.

"It's really rather a long story", I said, "but I'll give you the gist of it. Every morning early, the weather man makes his observations. It takes him from 15 to 20 minutes to read these instruments and the weather observers in all of the 200 stations make the observations at precisely the same time each morning. When the observations are completed, the weather men send them to the central weather office in Washington, D. C., and to all other important offices in other cities BY TELEGRAPH and in code. All this information reaches all the stations at about the same time each morning and about one hour after the observations were taken.

"Now, when the weather observers in the various stations get these reports", I continued, "they immediately get busy. Each observer has a blank map of the United States on which the weather stations are shown by small circles. As the weather man receives his reports, he records the weather conditions at each station with appropriate signs. Let's take a case. Say this is the San Francisco station. We get word by telegraph that it's raining cats and dogs in Kansas City. So we write the letter R in the Kansas City circle. That means rain. If it's cloudy in Kansas City, we shade the Kansas City circle with a pencil. If it's partly cloudy, we shade half the circle. If it's clear, what do we do?"

"Leave the Kansas City circle white", said the visitor quickly.

"Right", said I. "And in case it's snowing in Kansas City, we write the letter S in the circle. Do you see?"

Austin said he saw.

"The direction of the wind is indicated by an arrow pointing in the proper direction", I went on. "Near each station, we enter figures recording the temperature, the barometer reading, the velocity of the wind, the rainfall or snow fall for the PRECEDING 24 HOURS AT THAT PLACE. After all the reports have been translated and entered on the weather map, we draw lines in RED through placed having the same barometric pressure. These lines are called ISOBARS. Other lines, drawn in BLUE, connect stations having the same temperature for the day. These are called ISOTHERMS. The complete chart is the weather map. Do

you see what we've done, Mr. Austin?"

"Yes", Austin answered. "It's just like you could get up in a balloon so high that you could see the whole United States, and then looked down and saw the weather in all parts of the country".

"Correct", said I. "But you'll notice we haven't done a thing but draw a picture of the weather for the whole Nation for one day. We haven't predicted the weather for the next day yet, have we?"

"I reckon not", Austin said. "And that's what I want to know about. What good are these charts after you've made them?"

"Why, the maps give a picture of the weather for this morning. With all the signs before us, we can generally predict the weather for that given day and even part of the day to follow", said I. "You see, the weather usually travels from WEST to EAST. Now, every weather map for the U. S. almost invariably shows places where the ATMOSPHERIC PRESSURE is above or below the normal. The places where the air pressure is below 30.00 inches, are marked LOWS. Regions where the pressure is above 30.00 inches are marked HIGHS. LOW PRESSURE AREAS ARE GENERALLY STORM AREAS".

"Now I'm beginning to see it all", the visitor said. "With all those measurements you make, you can tell where the storms are and which way they're moving, eh? If a fellow knows how fast a storm's moving and which way it's going, he can tell how soon it should hit <u>his country</u>, can't he?"

"Precisely", said I. "But you must remember that we don't fully understand all the signs yet. And then the weather's changeable. Sometimes the signs play false and that accounts for that one error out of ten predictions made by the weather man".

"Well, it's not so bad at that", said Austin as he turned away from the instrument board and headed for the stairs. "If I could hit the cattle market nine times in 10, I'd be fixed up mighty fine about now".

And with that wise remark, we went below.

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<u>ANNOUNCEMENT:</u> The Weather Man will chat with you again on Wednesday, January 25, when he will continue his short talks on something everybody talks about but nobody does much about. Station_____ will broadcast the next chat.

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UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN. Wed., Jan. 25

(NOT FOR PUBLICATION)

ANNOUNCEMENT: More information on the Weather Bureau's special weather service for farmers. That's what the Weather Man is going to tell Station_____'s radio listeners today. If you don't happen to be a farmer, you'll probably find that this information is interesting to townspeople too. Most folks haven't heard this story before. Please stand by.

---ooOoo---

Speaking as the man who makes the weather-- although I really don't have a thing to do with that--- I can tell you folks out there that we weather men think we know what parts of Weather Bureau work you're most familiar with.

The many perfectly welcome 'phone calls we get every day help us to read your interests.

For example, just the other day I got a call from the chairman of a committee that was planning a big farmers' social affair. It seems that they were going to have exhibits and their wives were going to serve hot coffee and hot food for the men in order to make the affair a big success. You know, women have it all figured out that no gathering of men is successful without food. Are they right?

Well, anyhow, this chairman wanted to know several weeks ahead what the chances were for good weather--- that is, clear weather--- on the day set for the big doings. He told me that many of the men wouldn't turn out if a blizzard came up or if it rained or if it was too blame cold. They had set the date for January 23.

What did I tell him? Well, I told him that a definite forecast could not be made so far in advance, but I asked him to call me again in 15 minutes. Then I went to the records for about 25 years back and found that in that particular community the latter part of January usually had been clear and rather crisp. I told the chairman when he called me back that the chances were in favor of a good day. It happened that the weather was fair.

Now, listen. We hope you won't all call your weather offices and ask for too many prophecies of this kind. Averages for a particular place and period of time are determined from what actually occured in many years of the past. If the record shows that there were more good days than hard ones the chances are more in favor of a good day--- that is all. Our records for the years past are mighty helpful and we're always glad to bring them out for your

use, but such records are not dependable for a reliable forecast.

But, I particularly wanted to tell you about snow charts today-- and flood predictions-- and other special services of the Weather Bureau.

Have you ever seen a snow chart? It's really a blank map of the United States on which specialists in the Weather Bureau plot, or set down, the snowfall over different parts of the Nation. These charts are gotten out every week during the winter months, from early in December to late in March, say. All you have to do is to look at this map and you can tell at a glance where in the United States the snowfall is heaviest. Also where it's lightest. And also where there's no snow at all. Areas having some snowfall are shaded in red. A glance at the map about this time will show that the snow blanket is very thick in some parts, especially in the mountains, and very, very thin in others. The maps also show the depth of ice on rivers and other bodies of water. What good are the maps? Well, if you had to travel a lot in the winter time-- if you were engaged in the ice cutting business-- or in the manufacture or sale of goods affected by such conditions-- if you were a captain of a river or lake steamer-- if you were a farmer who depends a lot on this winter's snow to furnish next summer's water for his crops, you'd know what good they are.

Then, we mustn't forget the fruit grower in today's talk. In the old days, the fruit grower just took the weather as it came. If a frost came late and froze the blossoms on his fruit trees-- or if it came early and spoiled some of his fall crop-- he just gritted his teeth and probably made a vow that he'd never raise fruit or truck crops again as long as he lived. You'd doubtless find him doing business at the old stand the very next year-- and making good at it. Farmers are like that. But nowadays it's different. Nowadays, the orchardist insures himself against frost damage with smudge pots in his orchard, or else by actually taking out frost insurance. If he uses the smudge pots, the weather observers at his local office tell him when he'd better light up. If he insures his crop against frost by actually taking out a financial insurance policy, the weather men supply the insurance company with figures and records, so it's about the same in either case. It's all service to agriculture.

Maybe you didn't know about this matter of weather insurance. Hail insurance is really the oldest kind of distinctly weather insurance in the United States. It's written in large amounts in those States where hail damage is likely. Perhaps you didn't know that the total hail insurance premiums paid in the United States in 1924 amounted to about forty million dollars. Most of that sum, I imagine, went to agriculture.

Windstorm and tornado insurance is another promising side line of fire-insurance companies. Annual premiums paid out nowadays amount to something like thirty million dollars in this country alone.

Then there's rain insurance. It differs from other forms of weather insurance in that it doesn't cover property damage. Rain insurance is desig-

ned to cover events mainly-- ball games, prize fights, open-air concerts-- which depend on public patronage for their success. Some of the policies cover no more than three hours, but that's plenty long enough for a man to make a lot of money in a big public affair. Fair managers and retail stores advertising special sales often take out rain insurance.

Damage by lightning is generally covered in fire insurance, but there are certain freak types of insurance that might also be of interest. For instance, a motion picture company taking snow scenes once took out some insurance to protect itself in case it didn't snow.

Modern, scientific farmers are insuring their crops when they consider it a good investment to do so. That decision, of course, is up to the farmer. Up-to-date methods of scientific farming are making it possible for farmers to take a good many of the hazards out of their business that has so long been hazardous. It's likely that crop insurance will go still further in giving farmers still more peace of mind. The study of climatic factors in certain areas enables the farmer to even choose the regions where he wants to grow the crops he is interested in. That study also makes it possible for him to decide whether to insure his crops by smudge pots or commercial insurance policies or both, it seems to me.

During recent years, the Department of Agriculture has gone into this matter of crop insurance with a lot of care. So have a number of foreign countries. In fact, some countries have gone so far as to put direct governmental supervision over insurance companies that insure crops against weather damage.

That reminds me. I was also going to mention flood insurance. A man would think that not much can be done to regulate the flow of great rivers. But it <u>is</u> possible to determine something about how much water there'll be in those rivers at different times from year to year. The men who operate the dams and locks along the Ohio river, for example, are interested in knowing about the rise and fall of that river. Without some such knowledge, the operation of the locks and dams is conducted with great difficulty and sometimes with great loss. Operators of electric power plants along the rivers also want to know how high the water will be in different years and during different seasons in the same year. The farmer also wants to know if that river is likely to overflow its banks and endanger his crops.

How do the river experts in the Weather Bureau work? Well, the quantity of water in a river depends to a very large extent on the quantity of rainfall in the section of the country through which the stream flows. For the purpose of aiding navigation, electric power men, and farmers, the Weather Bureau carries on special water-supply studies. Weather men measure the annual rainfall and then make special surveys which prove mighty valuable

to a large number of people living in the territories served by the streams. Having these figures before them, and knowing the habits of the particular rivers studied, the experts are usually able to predict very accurately the amount of rise and fall of waters in these rivers at given times.

Our time is up so we'd better sign off. But I'd like to say that the Weather Bureau will be glad to answer any questions you might want to ask on the work of the Bureau and how it can be of increased help to farmers and others. Just send them in. Another Weather Chat will be released on February 8. Watch for it.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN. Wed., Feb. 8/28

NOT FOR PUBLICATION

ANNOUNCEMENT: Uncle Sam has a special WEATHER CHAT for Station _____'s radio audience today. It deals with long range weather forecasting, that is forecasting the weather weeks, months, seasons, or even a year ahead. A good many people have been wondering what the Weather Bureau is doing about this kind of forecasting --- whether it's really practical --- whether it's really scientific. Well, the Weather Bureau is studying the matter with care and attention. And in today's CHAT, the Chief of the Weather Bureau makes a statement on the matter. So please stand by.

---ooOoo---

The Weather Bureau of the U. S. Department of Agriculture will employ long range weather forecasting just as soon as it can be put on a scientific basis rather than a foundation of mere guess-work.

The Weather Bureau and other scientific agencies have, for a long time, been studying the possibilities of long range forecasting. To date, no practicable means have been devised and so-called forecasts of this character are no better than mere guesses.

The entire scientific staff has the utmost confidence in the soundness of the scientific views and practices of the Weather Bureau and believes that these will stand the most sincere scrutiny of honest, capable, unprejudiced scientists. The weather chief's statement follows:

"Throughout the past several hundred years, there has seldom been a time when one or more long range weather forecasters have not sought to interest the public in their sensational claims. These have flourished for a time, only to pass into obscurity. Neither the claims nor the theories have been able to survive the inexorable test of time.

"Similarly, from time to time since the establishment of the Weather Bureau in 1871, some such forecasters have tried to advertise themselves and their views by violent abuse of the Federal officials for not endorsing their claims. The same thing has happened in England, France, Germany, Italy and elsewhere. Instances of such forecasters operating independently of and in conflict with the collective experience and knowledge of the professional meteorologist are old stories.

"In contrast to these, another class of students apply their time and efforts along sound and accepted scientific lines to solve the problem of long range forecasting by honest and intelligent effort. Professional

meteorologist feel no hostility towards these earnest students. As a matter of fact, leaders in this class are to be found both within and without the great national services, and cordial friendship and cooperation prevail between all such private and professional workers.

"Within the United States the Weather Bureau holds a leading place in this line of meteorological progress, and the pages of its Monthly Weather Review carry many notable and original contributions of a progressive character, dealing with sunspots; solar radiation; solar and terrestrial correlations; the laws of sequence of weather conditions; the dependence of present weather in one part of the globe upon antecedent conditions somewhere else, etc.

"These topics collectively embrace all the known possibilities upon which long range forecasting can be rationally based. The meteorological library of the Weather Bureau is unique as a collection of publications of the widest scope, covering the field of meteorology and related sciences.

"For several years past one official has devoted practically his entire time to the review of past and current literature and the prosecution of special studies in the field of long range forecasting possibilities. In addition, others of the bureau, including the chief of the bureau himself, have given special attention to this line of inquiry. Any suggestion that will stand the test of analysis and possesses the promise of real forecasting value is welcome. The public may be well assured that the Weather Bureau speaks with authority, based upon positive knowledge, on any of these questions of long-range weather forecasts.

"While the prolonged researches of the professionals have disclosed thus far little more than encouragement, faint suggestions, possible clues --- something to be studied further --- the self-constituted forecasters seize upon, distort and exaggerate the suggestions of the students, and paraphrase their technical language into plausible effusions in order to justify their claims and their guesses to the credulous public.

"What are some of the lessons we may learn from the experiences of the year 1927, just closed? It is perhaps without a parallel in America because of the publicity given a series of calamitous and sensational weather and crop forecasts, and the severity of the personal criticism heaped upon the ability and integrity of the Federal meteorologists. Hundreds of letters and questions were addressed during the year to the Weather Bureau and its station officials, seeking the opinion of professional meteorologists on these forecasts.

"A widely distributed bulletin for 1927', contained this statement:

"'The forecast of 1927 for the United States and Canada is for a cold, dry year, taking the country as a whole. **** A cold wave will start in the northwest June 2, sweep across the corn belt as far south as the Ohio and

Potomac. * * * The period from June 28 to July 2 will see heavy frosts in portions of this same area, while the week from July 7 to July 11 will represent a second very dangerous date. The two periods in conjunction will have carried severe frosts and probably killing frosts through the great northern grain areas.'

"In another publication, this prediction was published:

"' * * * the years 1926-27 would be disastrous ones for mankind, in so far as extremely abnormal weather may bring disaster. * * * It is impossible for the grain crops of the Northern Hemisphere to escape serious injury this year (1926). * * * The world will come face to face with great danger in 1927, with its grain reserve exhausted. The great consuming populations of the industrial nations will be virtually reduced to the point of living from hand to mouth. The herds will be all but destroyed that the people may live. Europe's 1927 harvest will be destroyed by a repetition of the torrential and continuous rains of the terrible year 1315, black-lettered for six centuries. At the best, Europe will not have better than a 40 per cent harvest in 1927; America not better than 60 per cent.'

"To prepare for these impending disasters advice was given that,

"'Our Government should buy and store our surplus wheat instead of trying to dump it into Europe below the cost of production.'

"It is unimportant who is the author of these and other predictions. They were widely circulated in advance; they disturbed the orderly course of business; influenced the prices of, and favored harmful speculation in agricultural products; unduly aroused public fear and apprehension; worked unnecessary injury to the farmer, and--were not in any sense verified, as may easily be completely proved by reference to the weekly and monthly bulletins and reviews of the Weather Bureau, including the crop statistics for the United States and the world issued by the Crop Reporting Board of the Department of Agriculture.

"To summarize these statistics briefly, there were no summer frosts except in a region along the northern boundary of the United States, where summer frosts are relatively common. For example, some parts of Michigan have had freezing temperatures or lower in every month of the year for 23 out of the past 30 years. A minimum temperature as low as 20° was reported from Michigan July 1, 1903. Some parts of Pennsylvania have had freezing temperatures in July in one-half of the recent years. These are usual conditions and they do not verify predictions like those quoted.

"Instead of the predicted cold, dry year, with a short growing season, weather reports for the entire year, just received, show that over more than

80 per cent of the continental United States, from coast to coast, and from the Gulf northward, the mean temperature for the period was above normal, and markedly so in many sections. Below normal temperatures were recorded only in limited areas along the northern border of the country between the Lake region and Rocky Mountains.

"Precipitation for the year was above normal over most of the country, and was unusually plentiful over the great interior agricultural districts, while the growing season, on the whole, was prolonged and favorable, being longer than normal practically everywhere.

"Moreover, it is now well known that American, as well as world, production of crops was, in general, satisfactory. In this country the latest official reports show the composite yield of 24 principal crops to be about 7 per cent above the 10-year average, and the yield of 7 principal feed and food crops of the world was more than 5 per cent above the average for recent years.

"In the closing months of the year a new claimant for laurels in the field of commercial long-range forecasting was exploited by an association of industries in one of the New England States in a letter, dated November 25, 1927, addressed to all its members.

It appears he forecasts the temperature and rainfall for Boston a week in advance. The account compares his forecasts with those of the Weather Bureau made one day ahead and represents that his forecasts were absolutely O.K. 244 times, as compared with only 148 times for the Weather Bureau. Also 298 week-ahead forecasts could be claimed as right compared with 207 such forecasts by the Weather Bureau. Efforts of this department to secure access to the details of the competing forecasts and methods of verification have thus far failed. But long experience compels the department to check up on all such statements before reaching its conclusions. The Weather Bureau official investigating this case ascertained:

"'That the verification has been made by an officer of the local Chamber of Commerce. He had taken the Boston daily weather map issued by this department and had written on the back of it what he considered our forecast to be and added Mr. _____'s forecast. He next noted what he considered the following weather to be. He did not consult a thermometer at all to determine whether the weather was warmer or colder, or a raingage to determine the rainfall. He rather superciliously remarked that he could tell whether the weather was warmer or colder and did not need any thermometer. I suggested that his feelings might not be a correct guide and that other people might not feel the same. He brushed that away with a sweep of his hand and said that he knew his feelings were the same as the average man's and that was what was wanted.'

"The correctness of forecasts of any kind can not be determined by any such loose method of verification as indicated in the foregoing, and suspicion especially surrounds the whole subject when details of the forecasts and verifications are withheld.

"It is axiomatic that weather forecasts, whether for a short or a long time in advance, if made on a basis of pure guess work, will be valueless, although they get a certain verification, depending entirely on the laws of chance. On the other hand, such weather forecasts, to be successful, must satisfy the inexorable laws of physics. Speculations and effusions which disregard either or both of these prerequisites are mere sophistry, if not deliberate fraud.

"How absurd it is to suppose that the many Federal meteorologists, either collectively or individually, oppose and obstruct the progress of their science, or that they captiously reject discoveries and new knowledge of any kind. These men are finding their life work in devotion to a great public service. They welcome, intelligently and earnestly, every honest new idea that is sound and promises practical utility. The public justly looks to these officials for leadership in all such questions, but the Government can not allow itself to be duped and misled by the various sensational claims and representations that are made from time to time in the press and otherwise. All these must be thoroughly sifted before acceptance.

"The Federal meteorologists are animated by only one incentive, which is to give to the public complete and up-to-date advices, bulletins and warnings concerning past, present and future weather, and flood and crop conditions.

"These bulletins and reports are required by law and are made impartially without fear or favor. They are issued for the benefit of agriculture, commerce and navigation, and to protect the public against misrepresentation and fraud."

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ANNOUNCEMENT: Another WEATHER CHAT will be broadcast by this Station on Wednesday, February 22. Watch for it.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN — Wednesday, Feb. 22.

(NOT FOR PUBLICATION)

ANNOUNCEMENT: Every Man His Own Weather Observer. That's what the Weather Man is going to talk about today in his regular bi-weekly chat released by the U. S. Department of Agriculture. Some bad signs and also some good ones will come in for attention by this expert observer, so please stand by.

---ooOoo---

"My Aunt Het has it all figured out---" said I to the Weather Man as we sat in his office the other day, talking about this and that.

"Your Aunt Het has what figured out?" asked the W. M., putting the accent on the what.

"When it's going to rain", I said with a wink. "When her nose itches, it's going to rain. She says it never fails to work".

"In that case we'd better give her nose a job in the weather office", the Weather Man smiled.

I laughed right out. "You'd have to give Aunt Het a job, too", I said. "But my Cousin, Bill White, says his rheumatism tells him when wet weather's on the way".

"Interesting, if true", my friend said. "I know a man who plants his potatoes by the light of the moon and believes that walking under a ladder on Friday means 13 days of hard luck".

"Yeah", I drawled.

"Say, John, let's be serious", the W. M. said. "When you want to do a little amateur weather forecasting, look to the wind, the clouds, and--- the barometer. These three are worth more to the average man than most of the other weather signs put together".

"But every man doesn't own a barometer", said I. "We can all see when the moon changes".

"Will you ever be serious!" he exclaimed. "You can learn to read the clouds and the wind with a bit of practice. And there aren't many towns of any size at all that don't boast at least one barometer. Then, too, the weather maps issued by the U. S. Weather Bureau list the barometric readings for each day of the year. Follow these. It's a mighty small town where you won't find a weather map posted one place or another".

"Sure", said I. "But what do the readings mean? Here, take this weather map for instance. Look at those wavy black lines. Map looks like a crazy quilt--- the kind Grandma used to make back in the days when we wore ear muffs and had wax fruit in glass cages in the parlor. You tell me those black lines show the barometric pressure. All I see are the lines running every which way and the figures at the ends of them--- 30-point-zero; 29-point-9-30-point-1, and so on. They mean about as much to me as astrology."

"Be calm", said the W. M. "I don't expect YOU to know everything all at once. Sit down a minute and I'll tell you something about those lines.

"Now, a barometer's an instrument that registers the pressure of the atmosphere. There are different kinds of barometers just as there are different kinds of weather, and none of them are very complicated instruments, except the automatically recording ones. I can't take time now to explain the mechanics of a barometer, but the usual wall barometer has a thin column of mercury inside a glass tube. The air has weight which is termed as pressure. The height of the mercury inside the tube balances with this pressure of the atmosphere. A column of mercury thirty inches high, about balances the normal atmosphere's pressure at sea level.

"All right. A falling barometer--- in other words, a low reading--- generally means foul weather. This is especially true when the wind's from the east. A high, or rising barometer generally spells a clear-up or clear weather. And this is particularly true when the wind's out of the west. 'Wind from the west suits everyone best', you know. Well, a combination of wind and barometric readings is the best guide we have to future weather".

"How does a low barometer cause stormy weather?" I wanted to know.

The Weather Man smiled again. "It doesn't", he said. "A low barometer is the result of certain conditions of the atmosphere that usually go with a storm. Do you understand? A falling barometer doesn't cause a storm, John. A storm coming causes a falling barometer. For instance, if your barometer reads 29-point-8 inches and if the wind's right, that's an almost sure sign that foul weather's just around the corner. This condition, this kind of storm, is usually followed within 24 hours by a clear-up and, in winter, by colder weather. If the tube reads 30-point-1 and a fair wind's blowing, it means fair weather with small changes of temperature, to continue for one or two days. In spring and summer--- in most parts of the country--- a low barometer usually means wind and rain, and in winter, snow or sleet. Of course it depends on the geography".

I had a question I wanted to ask at this point. "What are these <u>areas of low barometric pressure</u> that you weather men talk about?"

"Areas of low barometric pressure are really whirlwinds of greater or less size and intensity, John", said the W. M. "That means, high winds blowing anti-clockwise inward into the funnel or circle. Areas of high barometric pressure, on the other hand, are featured by winds blowing spirally clockwise and outward, see?"

"I think I do", said I.

"You see", he went on, "the air tends to sweep inward to the areas of low pressure. And the wind directions produced by this tendency of air to seek low pressure areas are largely responsible for all local weather signs. South winds bring warmth--- north winds bring cold--- east winds, in the middle latitudes, show the approach from the westward of a low pressure area, or a storm--- and west winds indicate that the storm has passed to eastward and that a clear-up is in order. It varies some in summer and winter, but not so very much. The rule remains about the same".

My friend went on with his explanation. "From the Mississippi and Missouri valleys to the Atlantic Coast--- and also on the Pacific Coast--- rain generally comes with a falling barometer. In the Rocky Mountain and Plateau regions, and also on the eastern Rocky Mountain slopes, the rain seldom begins until the barometer starts to rise after its drop. Weather men know the variations in this rule and take account of them. The condition also varies some from summer to winter, as we know".

"Well", I said, "if all you say is true, why can't we make some hard-and-fast rule which will show just which barometric readings and wind directions mean stormy weather and which mean fair weather?"

"Pretty hard to make the weather follow what you call rules", the sky reader said with a smile. "But really there is something of a rule. Doesn't always work--- no rule does, seems to me. Usually it's pretty near the truth, though. Taking the United States as a whole, we can make out a table of wind and barometric indications and what they mean most of the time. In fact, the Weather Bureau has already made such a table and has been following it for more years than you have lived".

I blushed modestly.

"I won't have time to give you all the details", he went on, "but I can tell you the main parts of the matter. Listen closely and I'll tell you what certain barometric readings and wind directions mean as a general thing---

"Wind direction, southwest to northwest and barometer reading 30-point-1 to 30-point-2 and steady, means fair weather with slight temperature changes for one or two days. Wind direction, southwest to northwest, barometer 30-point-1 to 30-point-2 and rising fast, means fair, to be followed within two days by rain. Wind direction, south to southeast, barometer 30-point-1 to 30-point-2, and falling slowly, rain within 24 hours. Same wind directions, and the barometer falling fast, means rising wind and rain within 12 hours. Wind direction, southeast to northeast, barometer 30-point-zero or below, and falling slowly, rain will continue one or two days. Same, with barometer falling rapidly, spells rain with high winds, to be followed within 36 hours by a clear-up and, in winter, colder weather. Wind south to east, barometer 29-point-8 and falling rapidly, means a severe storm coming, to be followed

within 24 hours by a clear-up and, in winter, by colder weather. Wind blowing into the west, barometer 29-point-8 or below and rising fast, means clearing weather and colder".

"That's a good thing to know", said I. "And I'm going to take your advice and watch the weather maps and the barometer and wind from now on".

"Oh, I've given you only part of the story", said the Weather Man, "but I'll be glad to go into the matter further some day if you want to hear it".

I assured my friend that I would and said good-day.

---ooOoo---

ANNOUNCEMENT: Another CHAT BY THE WEATHER MAN, taking up another interesting phase of the weather and its ways, will be put on the air by Station_____ on Wednesday, March 7. Don't forget.

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UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN. Wed., March 7, 1928.

(NOT FOR PUBLICATION)

ANNOUNCEMENT: Would you know where to go for special information on the climate of any particular part of the United States? Let's say that you live in New England and are thinking of moving to Southern California. Or say you live in Oregon and want to move to Florida--- or in the Mid-West and want to go somewhere else. Where would you go to get information on the kind of weather they have in your chosen spot? Why, to the U. S. Weather Bureau. And the Weather Man, in his regular bi-weekly chat today, is going to tell you all about it. Please stand by.

---oOo---

As a rule, I call on the Weather Man in the forenoon, just after he has made his regular daily observations of the state of the weather, and is taking a few minutes to go through his mail. I find he usually has a bit more time to talk to me then.

This morning was no exception. I was after a radio story and told him so.

"How about this?" he asked. "Seems to me that your radio audience would be interested in this."

He picked up a letter from his desk and handed it to me. This is what it said:

"Dear Sir:

> I am a farmer living in.... (he mentioned a town down near the Mason and Dixon line) ....and would like to know if I can grow cotton successfully in this part of the country. Any information you could give me on this subject would be greatly appreciated by,
>
> Very truly yours,
>
> John Doe."

I turned to my friend, the weather observer. "What does Mr. Doe think you are, an agricultural encyclopedia?" I asked, rather jokingly.

The Weather Man turned from the papers on his desk and said. "Mr. Doe's question is fair enough. One of the main duties of the Weather Bureau is to answer just such questions."

"Oh, sure-ly," I said, accenting the sure, "but why doesn't your friend plant cotton and find out if it will grow for himself? Why doesn't

he ask his neighbors what their experience with cotton has been?"

"That's not the most intelligent question you have asked in yourlife," the W.M. replied. "And I'll tell you why. And, incidentally, I think you will be interested in what I am going to say. It ought to make a pretty fair radio story for you."

"Fire away", said I.

"You know", he began, "it's quite an expensive experiment to plant cotton when you're not sure beforehand that it will make good in your locality. And, of course, I'm using cotton only as an instance of the service the Weather Bureau renders to people who are interested in other crops and other climates. Furthermore, the neighbors haven't always learned just what's best for their particular neighborhood. To raise a good cotton crop, you need a certain amount of heat and moisture. You need a growing season of some length. You need a certain number of what are called heat-days or heat-units. The Weather Bureau has accurate, scientific information on the weather--- the rainfall, temperature, wind conditions, snowfall, sunshine, and so on-- for all parts of the United States. Farmers and other folks are learning this and beginning to call on us in case of need".

He picked up another opened letter. "This man", he said, "is interested in the weather of Southern California. He wants to know if it would be good for a man in his condition. Here's another fellow who wants to know about how much rain they have in northern New York State. And the man who wrote this letter is after information on what kind of a summer they had in the Corn Belt last year".

"I can see that part of it", I said. "I can easily understant how you can give information on the rainfall and temperature of last summer, say. But maybe last summer was a freak. The weather's pretty changeable".

The Weather Man agreed with that. "But," said he, "one season doesn't make a climate of a particular section of the country any more than one swallow makes a summer."

He pointed to the well-filled batteries of filing cases, to the stacks of bound volumes in the book cases. I couldn't quite see through it all, but I was certainly impressed.

"Now, listen," he said, "and I'll tell you how we go about this climate work. This special work is done in what we call the Climatological (Klí´-ma-to-log´-i-kal) Division of the Weather Bureau. Dr. P. C. Day is the head of the Division and the central office is in Washington.

"Well, the United States is divided into 106 sections for the purpose of this climatological work. Most States have more than one of the sections. Utah, for example, has two and Texas has five. The sections are numbered. Southern Texas is number one and Maine is 106. Now, in the entire United States, there are about 200 official U. S. Weather Bureau observatories, but there are more than 5,000 places in the U.S.A. where weather observations are taken and recorded every day and then sent in to regular Weather Stations. There is a trained weather observer at each station--- and several at some. There is at least one official Government weather observer, or meteorologist, at each official U. S. Weather Station. Do you see what I'm driving at?"

"I think you are showing me how you make the climate," said I with a wink. I knew how the Weather Man would take that.

"Wrong", he said with a smile. "You know better than that. I'm trying to show you how we record the weather from day to day. The day-by-day, year-by-year, century-by-century weather makes the climate of a section or a nation. See?

"You know," the W.M. went on, "the meteorologists stationed at the various Weather Bureau posts make daily records of the weather in their territory. These records are sent in to the central Weather Bureau office in Washington.

"They include rainfall and snowfall, heat and cold, wind velocity, length of season, sunshine and cloud, that sort of thing. All the many conditions that go to make up the weather from day to day are carefully observed and entered in these records. When the central weather office receives these records, we condense them and tabulate them for months and years. For each section, mind you. For each of the 106 sections I told you about."

"The records tell, then, how much rain a certain section had in a certain season, eh?" I said. "And how hot it was, how windy, how cold."

"Right," my friend replied.

"How long has this been going on?" I asked.

"This has been going on officially since 1871. The Weather Bureau has rather complete records for the 57 years since that time. Of course we had some records even before 1871. Many people keep accurate weather observations in their diaries or family records. But the official records date from 1871 and are published--- for each section and for the Nation as a whole--- in regular printed reports issued each month and year. The Weather Bureau also gets out an extensive report on the weather and climate of each section at intervals of about 10 years. The last ones published, brought the records down to 1920. Another edition is due in 1930. In addition to giving tables of precipitation, temperature, and such things, the reports tell about the general climate of each section and about any peculiar or unusual weather conditions, such as floods, cyclones, droughts and extreme cold, hot, or dry periods. Do you understand?"

"I think I do," I said. "But can a man get these reports as well as other information on the climate and weather of any section he's interested in?"

"Of course he can", the Weather Man assured me. "That's one reason why we publish them. Detailed weather information to a reasonable amount is furnished free on application to the Weather Bureau."

"Well, how do they use the information when they get it?" I next wanted to know. The Weather Man had some instances of how the information has been used. He told me that farmers thinking of moving from one locality

to another are naturally
/interested in knowing what kind of crops can be grown successfully in the place they plan to move to. Business men, doctors, lawyers, all classes of people, he said, use the published weather records in some way or another very often. A man wants to take a vacation--- an invalid wants to move to a healthier climate--- a man wants a change of scene. They all find the answers to their questions in the central office in Washington or in the various district offices of the Weather Bureau.

"For example," the W. M. went on, "a big insurance company used our records in rating a western city for fire insurance. The company wanted to find out the number of days there were in the year in that place on which the wind blew 25 miles an hour or more--- also the snowfall and temperature of the city. Real estate dealers use our publications to show prospective buyers the climate in the places where they plan to buy property. A city engineer in a western town made good use of the Weather Bureau reports in determining the size of the sewer mains laid in the town. Mains that could handle a maximum rainfall for that town, were installed."

I was convinced. "It looks like a man can just about choose his own climate these days," I said as I arose to leave.

"He can," said the Weather Man, "if he first finds out accurately what that climate is like."

-ooOoo-

ANNOUNCEMENT: This Station will broadcast another timely weather chat from the U. S. Department of Agriculture on Wednesday, March 21, 1928.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

CHATS BY THE WEATHER MAN. Wed., March 21, 1928.

NOT FOR PUBLICATION

ANNOUNCEMENT: It's about time for the buds to burst--- for the robins and the larks to show up--- for the warm spring rains to fall. Rain, rain, bee-oo-ti-ful RAIN! Who was it said that? Everybody says it now, but I mean, who said it first? Well--- never mind. Anyhow, this time of year makes the weather man poetic, so watch out! He's going to talk about how spring comes and tell you a lot about rain in today's CHAT, so please stand by.

-ooOOOoo-

A few bursting buds,(Listen! You can almost hear 'em!), a gentle shower or two, some plowmen in the fields, and perhaps a few fat worms peeping from the soil only to be gobbled up by the early birds--- Well, those things almost make a poet out of me. Oh, I don't mean that spring makes me write verse! Too busy just now writing weather reports and such things. But spring does make me think verse--- and sometimes recite some, when the folks will let me. In fact, I'm going to try a little verse on you. Hold your seats--- it's short. But beautiful. All about spring. I don't remember who wrote it, but it goes like this:

"'Tis like the birthday of the world
When earth was born in bloom.
The light is made of many dyes,
The air is all perfume.
There are crimson buds, and white, and blue,
The very rainbow showers
Have turned to blossom,
Where they fell, and sown the earth with flowers."

Pretty, isn't it? But of course rain isn't always gentle like that. Sometimes rain comes pelting down with the force of little hammers, rather than like flower petals falling to the earth. Sometimes rain comes in sweeping, wind-blown sheets that rattle the windows and leak through the roof onto the new rug that cost 50 dollars. Then you don't feel so poetic about it, eh?

Reminds me of a yarn one of our weather observers tells of a cloud burst he once saw out in the Rocky Mountains. He tells the story this way:

"I was on an excursion with some relatives, up around Silver Plume, near Georgetown Loop, in the mountains west of Denver, Colorado, a number of years ago. It was a hot, sultry day and so, noticing a small patch of snow near the timber line on a neighboring peak, I decided to climb to the snow

and do a little wading in snow in the summer time appealedto the child in me, Wading in the snow in the summer time appealed to the child in me I guess.

"So that's what I did. Believe me, that cold snow felt good after the long, hot climb up the side of that mountain.

"The great peaks: Long's Peak, Gray's, Evans', Arapahoe, and Pike's--- all near 14 thousand feet high--- were silent and majestic in the still air of that summer day of years ago. I noticed the clouds. All the peaks showed dense cumuli clouds nestling on them like giant grey hens trying to hatch out a mountain. Soon great clouds crept up and hid the lower parts of the mountain. The air became almost as black as midnight and I heard the muttering and rumbling of a thunderstorm far away. The wind howled through the pines, whistling. A few scared little drops of rain were whirled into my face by the wind. Then the storm broke and I had a grandstand seat. Terrible thunder crashed and grumbled and burst from the heavens. Lightning flashes, almost as thick as a man's thigh, sizzled through the air. I shudder even yet when I think of that storm.

"The storm rolled down like a procession of a thousand loaded express trains passing each other at high speed. The wind almost blew me off the mountain and I flattened myself on the ground and held onto a scrub pine for dear life. Great blobs of water, whirled by the wind, drenched me--- then fine hail, and later, sharp tiny spears of ice pelted the mountain side. As the barrel-like cloud swept on darkly with the wind, the straight tempest from the West was followed by blinding sheets of rain. It was a gullywasher, if there ever was one,

"Well, I hung on till the storm passed on and then shambled wearily down the mountain side. As I stumbled along, the sun came out and scorched me. Water-logged and blown, I was more than glad to rejoin my friends at the foot of the peak. I had lost all interest in wading in snow in the summer and had developed a healthy respect for mountain storms in general."

Cloud bursts may not be pleasant, but every one knows that we have to have rain to live. Isn't it queer how we depend on the elements, anyhow? Not alone for food and clothing. Even for our moods, we look to the weather. Take a summer rain, for example. It's beautiful and clean and exhilarating. It gives the atmosphere an indescribable feel that nothing else can give it. On a summer night, when the sky is black and threatening, you know that something is going to happen to you and all the world. The wind comes up---the thunder growls and rumbles, increasing to shattering crashes that seem to rock the house. Then the lightning and then the rain. After a few minutes, it's all over. The wind dies down--- a few light patters of rain on the roof--- and the storm slinks away as mysteriously as it came. But it leaves the world quiet and cool and serene. You go to sleep, feeling that everything is indescribably right with the old world after all. You awake next morning to see the world new born--- the trees and flowers brighter and fresher than ever--- the sky a living, flashing blue. That's what a summer shower can do.

But that's not <u>all</u> that rain can do. We might possibly get along without wind or snow or fog. But we <u>must</u> have rain in proper quantities and distributed in the right averages and extremes or our crops fail and

starvation creeps like a gaunt skeleton upon our homes. In the United States, it's during the growing season of a scant three or four months that we need rain most. There must be enough heat to start life growing in the soil; then rain to feed the plants; then sunlight to ripen the fruit and grain. Sounds simple, doesn't it?--- this great parade of the storms, the sun, and the growing things. But it's one of the most complex of all things, because it's life itself.

The farmer may think he has a hard job cultivating and harvesting his crops. But if Nature should refuse her help for a single season, it would tell a story of bankruptcy and famine throughout the country. It takes from 12 to 15 inches of rain to mature an ordinary crop in an average American farming community. This really amounts to from 14 to 16 hundred tons of water per acre a year. Now, suppose that Mr. Farmer found, at the beginning of the season, that he had to haul all that water to his crops or else they wouldn't grow. And suppose it costs him a dollar a load. Where would his season's profits go? They'd certainly go on the water wagon, seems to me. In addition, he'd have to spend still more money to buy fertilizer, for his land, fertilizer which the rain washes down from the air.

That's how it is with rainfall, you know. Nothing else will quite do--- except in small, isolated areas where artificial rainfall, or irrigation, is provided against the shortage of rain.

Some parts of the world get many times as much rainfall as others and damage may result from this excessive fall. Heavy rains wash away the soil and there's a constant loss of fertility because of the rain. Millions of tons of soil are carried off into the ocean every year by the rivers which are fed by the rain. The famous Yellow River of China, sometimes called the yellow peril or the river of sorrow, has had such vast floods in times past that as many as 50 thousand people have been killed by one tremendous fall of rain.

So,,you see, rain doesn't always come cheerfully and lightly. But it won't take much deep and painful thought to see that the benefits of rain far outnumber the disadvantages. If rain washes away some of our choicest soil, it breaks down the rocks to make new soil. If rain washes some fertilizer away, it is constantly bringing down from the air more of the same valuable substance. Every thunderstorm brings us a fresh supply of ozone to purify the air we breathe. Though the rain may cause the noxious and poisonous weed to grow and flourish, it likewise makes the bounteous fields of grain, the rich orchards, the flowers grow and produce food and beauty. Rain has been called the oil of gladness which lubricates the mental and physical machinery of the farmer and so makes us all happier and more prosperous.

And then just look what the rain means to poets--- especially in the spring!

We've given you one example of what that means.

-ooOOoo-

ANNOUNCEMENT: Station ____ would welcome letters from its radio audience mentioning this weather chat and the other talks in the Weather Man series which Uncle Sam gets out every two weeks. Are there any points on the weather that you would like discussed in these talks? How do you like them? How do you think they can be improved? We'd like to hear from you, so please drop us a line some day.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

PROGRAM CHATS BY THE WEATHER MAN. RELEASE Wed. April 4/28

NOT FOR PUBLICATION

ANNOUNCEMENT: Today's CHAT BY THE WEATHER MAN tells one important way that man is taking advantage of his science to beat the weather. The Weather Man is going to talk about protecting orchards from frost and orchardists should be interested because they want to know how it's done. Other folks should also be interested because they want a supply of apples and other fruits this year. So please stand by.

---ooOoo---

The Weather Man and I were driving through a beautiful stretch of rolling orchard country. The buds were beginning to burst already on some of the trees. It looked as if the trees were stretching out tiny pink fingers into the warm spring air.

Anyhow, that's what I was thinking.

Just then, the Weather Man looked at me and said, "Mark Twain was wrong, Jim".

Now I've always been a great admirer of Mark Twain. "How come?" I said, rather warmly, I guess.

"Well, he said that 'everybody talks about the weather but nobody does anything about it'", my friend, the W.M. said.

"Oh, that," I said. "I guess we'll have to allow Mark Twain enough author's license to make a joke about the weather, won't we?" I asked.

"But we do do something about it, Jim," he said. "Take these orchards for example. In the old days, the prosperity of the fruit growers depended almost entirely on the weather. Good growing weather--- no late frosts-- that meant good crops, as a rule. Of course the insect pests had to be considered. And the orchardist had to pay attention to his markets, too. But old Jack Frost used to take a lot of the profit out of fruit growing."

"How has that changed lately?" I wanted to know. "We still get frosts, don't we? I don't know as I've heard that frozen crops have been entirely eliminated in the last few years, either."

The Weather Man smiled. "Oh, I didn't mean that man in his wisdom has cut out frosts," he drawled. "But man has learned that frost isn't the unbeatable, blustering old fellow we once thought he was. Nowadays, we let him come-- but we get ready for him with our oil burners and our frost warnings. A few heaters in the orchard is generally enough to get old Jack down and hogtie him."

"That's all very well," said I. "But first you must know when he's coming so as to have a warm reception all ready for him."

"Easy. That's where the Weather Bureau steps in. Last winter, in one very important fruit-growing district, the weather observers made 48 distinct low temperature forecasts. Seventy nine per cent of these forecasts were correct within one degree. Ninety eight per cent were correct to within two degrees. The greatest miss during the entire winter was only 2.7 degrees. When temperatures are expected to fall as low as 32 degrees in any district during the night, a forecast is made and spread widely through that district. This forecast contains a definite statement, sometimes to tenths of a degree, as to just how low the temperature is expected to fall. I've just told you how few misses there are. There are eight trained Weather Bureau men assigned to the frost work and the forecasts are amazingly accurate.

"You know, Jim," the Weather Man went on, "there are certain warm-climate fruits, such as oranges, lemons, olives, dates, and figs. Then there are fruits, such as apples, cherries, currants, gooseberries, and cranberries, that thrive in cool regions. Because certain fruits thrive best in certain regions, farmers and fruit growers have learned the limitations of those fruits and governed their orchard work accordingly. Citrus fruit originated in the tropics and for that reason, citrus growing in the United States is limited to warm country, such as California and Florida. But even there, they sometimes have late frosts and that means that artificial protection against late frosts is demanded. The fruit industry is a huge business and can afford to spend large sums of money for this protection."

"But what I want to know is how orchardists protect the fruit from the frost," I put in.

"Well, in the early days, they built log fires in the orchard," the W. M. told me. "Later on, they used coke burners. About 1896, orchardists were burning coal among the trees and by 1910, open cans or pots, holding one or two gallons of oil, were introduced. Since then, that last practice has become most popular. Take the destructive freeze of 1913, for instance. That big frost hastened the use of burners in practically all of the big citrus orchards. The growers decided that if they were to keep the fruit growing industry on a paying basis, they'd have to be prepared to protect their fruit against unexpected visits of freezing weather. At first they thought that the best protection was gained by covering the orchard with a dense blanket of smoke. They soon found out, however, that heat, not smoke, is what is needed. And so nowadays, the up-to-date growers use a well-made heater with a capacity of nine gallons of oil, well-fitting draft regulators, and improved smoke stacks. These reduce the quantity of smoke to a minimum. The heaters cost about three dollars each. About 50 heaters are needed for each acre of orchard."

"Why is it," I asked, "that fruit needs protection when vegetables and other crops seem to get along without it, fairly well?"

"Some vegetables and other crops do need frost protection--at least in some parts of the country," the Weather Man said. "You cover your young tomato plants, don't you? But the weather risk in fruit growing is far greater than for most other crops, mainly because of low winter temperatures which damage twigs and buds, and spring frosts which kill advanced buds and blossoms. Sometimes, short periods of warm weather in the winter start the buds growing. The cold weather that comes later will kill these buds--if they're not protected. Then, too, vegetables and similar crops are annuals, planted every year. A farmer can plant his seed when danger from frost is past. But the fruit trees last many years and they stand there in the orchard at the mercy of any sudden freeze that happens to come along."

"I see," said I. "Now tell me how they operate the heaters on a large scale".

"First of all, Jim, the orchard heating must be done systematically, to be successful. There must be plenty of equipment and a good reserve of fuel oil. The really big-time orchardists build central tanks in their orchards. These serve as reservoirs for the fuel oil and are filled during the summer. In California, the heaters are placed in the orchards about October 15th. Then they're all ready for any early frosts. Then, with the heaters all set and plenty of oil on hand for emergencies, word from the Weather Bureau as to the approach of a cold wave is awaited. We usually pass the word along two or three days ahead of the approaching freeze. The big orchards are divided into sections, with a central weather station in each section. A watchman is placed at each central station. When the temperature at his station gets near the danger point, a runner is sent out to find the temperature in the coldest spot in the orchard. He returns quickly, and, if the temperature has reached the danger point, a gang of lighters is sent out to light the burners. At first, only part of the heaters are lighted. Then, if it still grows colder, more are set burning. If it gets warmer, fewer heaters are lighted. In this way--- aided by forecasts from the Weather Bureau stations, - the fruit grower is able to save oil and his fruit at the same time. It's a mighty good thing, too, for both are valuable. Vast sums of money are saved in this way every year. Furthermore, a big orchardist rarely loses his fruit crop these days. They're getting wise and they know what to do to protect their valuable crop."

Just then we were hailed by a man we know and stopped to talk to him for a bit. But the Weather Man had told me something that I was to think about for some time after that, I found.

---ooOoo---

ANNOUNCEMENT: The Weather Man will go on the air from Station _____ again on Wednesday, April 18. Watch for him.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

CHAT BY THE WEATHER MAN Wed. April 18.

(NOT FOR PUBLICATION)

ANNOUNCEMENT: Next week is American Forest Week. Don't forget. In order to help you keep the Week in mind, the Weather Man is going to tell you about forest fires and how the Weather Bureau helps fight them, today. His talk comes as this week's regular CHATS BY THE WEATHER MAN, a radio feature prepared by the U. S. Department of Agriculture and broadcast bi-weekly by Station_____. Please stand by.

---ooOoo---

Good hiking weather.

So my friend, the Weather Man, and I took a long walk into the woods the other day.

We were sitting on a sun-warmed rock under a tall pine, fragrant and friendly. A little, timid breeze fluttered and whispered through the branches.

The Weather Man looked up through the pine branches into the blue sky and sighed deeply and happily.

"Bill," he said, "this is certainly great. I wonder if you remember what that good friend of our forests, John Muir, once said...."

I picked out a brown pine needle and chewed it reflectively. "Don't believe I do," I said.

"'The forests of America,' said Muir, 'however slighted by man, must have been a great delight to God, for they were the best he ever planted'".

"But why did he say, 'must have been', 'were', and so on?" I asked. Don't we still have beautiful forests in America?"

"Why yes, Bill," my friend said. "But fires and carelessness and lack of conservation measures are rapidly cutting down on them. Fire, of course, is the greatest single menace to our forests. The United States Forest Service says that we have had 51 thousand forest fires in this country in 10 years. Fire sweeps over an average area of 15 million acres every year in this country alone. More than 11 million acres of this are forest land. The annual fire damage to our forests runs into 20 million dollars, not counting the damage done to young forest growth, watersheds, and other damage for which we can make no estimates in money. Think of it!"

I was surprised and showed it. Of course I knew that forest fires reap a terrific harvest every year in the U. S., but I didn't know it is as heavy as this.

"But that's not all," the Weather Man went on. "Forest fires are a great enemy of wild life-- game, birds, fish. Fires sweep over the nesting grounds of grouse and other game birds, destroying eggs and young birds. Fires destroy the forage on which big game lives. When fires come late in the fall, big game frequently dies of starvation the following winter. Fires spoil the fishing. Every Izaak Walton knows that good fishing depends on clear waters, and fires leave the streams and lakes muddy and dirty. If sportsmen only took more thought on how birds and animals are driven out by fire--- how coverts and nests are destroyed--- and how much wild life food goes up in the smoke from forest fires--- they'd be very, very careful with campfires, smokes, and firearms when in the woods."

The Weather Man stopped for a moment and looked off into the woods. Then he continued. "Forest fires destroy lumber, injure labor, kill industry, rob the community, and increase taxes," he said. "And the worst part of it is, 90 per cent of all forest fires are caused by man himself. WHEN THE AMERICAN PEOPLE STOP BURNING THEIR WOODED AREAS, THEIR FORESTS, THE SOLUTION OF THE NATION'S TIMBER SUPPLY PROBLEM WON'T BE FAR OFF!"

"Well, for the love of Pete, isn't there something we can do about this!" I said, rather excitedly I guess.

"Why, sure," said the Weather Man confidently. "And some day, forest fires are going to be rather a scarce article. First, we've got to educate the people as to the real meaning, the real danger, of forest fires. That's one reason why we have Forest Week. We need a book of etiquette for campers, see? Something to teach folks how to behave in the woods. Then we must develop still further our fire-weather warnings service of the Weather Bureau. The Forest Service is doing all it can to cooperate with us in this."

"Do you mean that the Weather Bureau can forecast fire-weather"? I asked in amazement.

"Exactly," said the Weather Man.

"How?"

The Weather Man leaned back against a friendly old pine and began.....

"Most folks think that summer's the danger-time for forest fires," he said. "That's not so. Spring and fall are the worst forest-fire seasons, especially in the eastern sections of the country. In summer, the woods are green with leaves. In winter, snow and rain keep the timber and brush wet. But the forests are ripe for trouble in spring and fall.

"Issuing fire-weather forecasts isn't a new thing exactly," he continued. "At first, the regular daily weather forecasts were used mainly by the forestry interests in the Pacific Coast States. Soon, however, we learned more about their value and then we extended the service. At present, the Weather Bureau's fire-weather warning service is divided into seven districts. I could quote you a score of letters from men who know what they're talking about, showing the value of the service. There have been times when fire-weather warnings, issued by one or more of these offices, have saved damage to the forests more than equal to the entire cost of the whole weather forecast service."

"Tell me about the warnings," I said. "How do you get them out?"

"That depends somewhat on the region," my friend said. "The worst fires in Washington and Oregon occur along with the dreaded east wind. When even moderately dry, warm weather comes before these east winds, conditions are caused which start forest fires easily. And when they start.... ! Well, even the best-organized plans of men have a mighty hard to stop them. Very often, the fires aren't put out until they've destroyed vast areas of valuable timber land."

"If we know what the weather is today--- and what it will be tomorrow--- over large areas in the forest regions, we can put experience and science together and make forecasts of value for the entire region. There are times when the fire hazard is low and fires are few. There are other times when fires break out easily and spread rapidly--- without apparent reason. We now know that this difference in fire hazards is caused mainly by differences in the drying power of the air from time to time. When the air is dry, material dries out quickly and fires start easily, see? A foreknowledge, then, of the humidity of the air--- that is, of its moisture content--- will go a long way toward accurate fire-weather forecasting. And, when the fires once start, this knowledge will help to fight the fire already under way.

"Now, meteorologists, weather observers, at the different weather and forest stations in fire areas make their daily observations of wind, humidity, and other weather conditions, with the aid of their instruments and the reports from the other stations," the Weather Man said. "Then they draw up their weather charts, much the same way as all other weather observers do, for use in their own territory. I've already told you, Bill, how the weather maps are made and how we make our daily observations. It's not so different in fire areas, except that we pay special attention to fire-weather and learn by experience what to expect under certain conditions. Then, of course, we become forest-conscious, tree-conscious, as you might say. We know that we're making things safer for these beautiful trees, for these forests that mean so much to America and Americans."

I looked around me--- heard the wind in the pines--- smelled the tang of the needles and the bark---- heard the cool ripple of the little creek down in the hollow. The Weather Man had told his story. I waited a minute or two. Then---

"I think I see what you're working for," I said.

---ooOoo---

ANNOUNCEMENT: When you go into the woods, remember what the forest experts say. If you want more information on how to prevent forest fires, drop us a line soon.

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